Respiratory Medicine (2006) **100**, 1121–1122

respiratoryMEDICINE

## LETTER TO THE EDITOR

### Malignant pleural mesothelioma: Occupational and environmental exposure

In their recently published article Chang et al.[1] has studied the epidemiology of the malignant mesothelioma in Hong Kong from1988 to 2002. They reported 48 mesothelioma patients with male predominance (79%) and occupational asbestos exposure in 32 subjects. And the estimated annual incidence was one per million.

Malignant pleural mesothelioma (MPM) is a locally aggressive lethal tumor, which is one of the most prevalent fiber-related-cancers in Turkey. Although the disease is mostly developed by an occupational exposure of asbestos in the western world; in Turkey, it is usually caused by environmental exposure to asbestos and also erionite fibres.[2] MPM is uncommon cancer, but can no longer be considered rare with more than 2000 cases per year diagnosed in the USA alone.[3] Annual incidence is 22 per million in the UK and 9 per million in USA.[4,5] The estimated incidence of MPM was 43 per 1 million inhabitants in the southeast of Turkey, and 996 per 100,000 inhabitants in the population exposed to erionite in erionite villages in the Cappadocian region of central Anatolia.[6,7] A recent survey of the incidences and distributions of malignant mesotheliomas in Turkey revealed a total of 506 new cases (464 pleural, 42 peritoneal) for the year 2000. The female-to-male incidence ratio was 213/293 (42%) which is relatively higher than Chang's[1] report. In all these cases no history of occupational exposure to either asbestos or erionite was obtained. Six percent of cases (30/506) were reported from the erionite villages.[8]

Approximately 80% of mesothelioma cases had past asbestos exposure.[9] Other implicated causes of mesothelioma include simian virus-40 (SV40),[10] radiotherapy or thorium dioxide use,[11] and[12] erionite fibres,[7] chronic pleural inflammation,[13] and chemical carcinogens.[14] Sources of asbestos exposure are occupations of asbestos mining and processing, industrial and commercial use of asbestos, paraoccupational exposure such as family members who have occupational exposure, and environmental exposure. Environmental asbestos exposure have been associated with the development of mesothelioma especially in Turkey, Australia and South Africa.[3,6,7,15] However, environmental asbestos contributes nearly all the mesothelioma cases in Turkey.[6,7] Occupational exposure of asbestos might have been masked by the geographical characteristics of Turkey.

Turkey has the highest prevalence of endemic asbestos-related pulmonary disease.[16] The reason of this high prevalence can be attributed to the large population of the country and the geology, which includes numerous outcrops of asbestos. Asbestos deposits have for many years been used locally by the rural inhabitants to make a whitewash or stucco for the walls, floors, and roofs of the houses and also as a substitute for baby powder.[17] There is in addition another mineral fiber, which is found particularly in three villages located in the Cappadocian region of Central Anatolia in Turkey.[8] This is a non-asbestos mineral, which has been identified as the fibrous zeolite, erionite. This fiber is present in the volcanic tuffs, which are used as a source of building stone and hence exposure to erionite fibers is always possible in the houses and annexes of the villages. Experimental studies showed that erionite has 300–800 times more carcinogenic potency than chrysotile, and 100–500 times more such potency than crocidolite when given through intrapleural routes.[18]

In summary, mesothelioma with occupational asbestos exposure differs from that due to environmental exposure in respect to female-male ratio and environmental exposure is responsible for MPM nearly in all cases in Turkey.

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0954-6111/$ - see front matter 
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